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more complete, but unfortunately the typographical errors are rather annoying. The Hymenoptera occupy 170 pages of Volume III, the larger part of which treats of the gallflies and sawflies. The Diptera occupy the remainder of Volume III., and are treated at more length than the preceding orders. The fleas occupy the position of a family at the end of the order. Several Trypetidæ, especially *Dacus oleæ*, *Ceratitis hispanica* and *Rhagoletis cerasi* are treated in much detail. The Hessian fly, which appears under the unfamiliar generic name of *Mayetiola*, occupies fourteen pages.

In the fourth volume the Neuroptera are passed over rather hastily. The Pseudoneuroptera are included under the Orthoptera. The Hemiptera receive the fullest treatment of all. Over 180 pages are occupied with the Aphidæ, and 200 with the Coccidæ. *Phylloxera* covers 75 pages. Nearly all the Coccidæ are figured. Under the name of *Aonidiella perniciosus*, a long account is given of the San Jose scale. In the Orthoptera considerable space is devoted to the remedies for grasshoppers; spraying machines and catching machines, drawn by two men, seem to be especially favored. The volume concludes with a brief notice of the Thysanura under the ordinal name of Pseudoinsecta.

NATHAN BANKS.

An Introduction to Modern Scientific Chemistry, in the form of popular Lectures suited for University Extension students and general readers. By Professor LASSAR-COHN, Ph.D., University of Königsberg. Translated from the Second Edition by M. M. PATTISON MUIR, M.A., Cambridge. New York, D. Van Nostrand Company. Pp. viii + 348. Price, \$2.00.

The author's preface says: "In this introduction to *Modern Scientific Chemistry* an attempt is made to give a succinct and accurate presentation of chemistry on strictly scientific lines, and at the same time in as popular a form as is compatible with the vast range of the subject. The book can be followed easily by any one who takes a serious interest in natural science, and will not, I hope, be unwelcome to the younger chemists who are still pursuing their studies. A teacher of chemistry

who may not have paid special attention to the methods of presenting his subject will perhaps find in the book something useful to himself and helpful to his hearers."

A careful examination of the text impresses one with the idea that the author has made a particularly happy use of the word modern in his title; and that the promises of the preface have been abundantly fulfilled. The author has been eminently successful in solving the difficult problem of giving the theories and facts of chemistry in a form not only popular but exact. The keynote of the book is its emphasis of the fundamental conceptions of the science.

The style is clear, convincing and always interesting. While the book is intended primarily for University Extension students and general readers, to the student and younger teachers of chemistry it offers a wealth of valuable, accurate information, especially concerning the chemical principles involved in the manufactures of illuminating gas, smokeless powders and other explosives, fertilizers, matches, glass, aluminium, etc.

The reader who does not find this book helpful and inspiring must be very well informed in scientific chemical subjects.

The translation is excellent, and will serve to introduce Professor Lassar-Cohn's work to a new world of readers.

The crudeness of the illustrations (by the author) is the only unsatisfactory feature of a book of rare merit.

WILLIAM B. SCHÖBER.

LEHIGH UNIVERSITY.

An Elementary Treatise on Qualitative Chemical Analysis. By J. F. SELLERS, Professor of Chemistry, Mercer University, Georgia. Boston, Ginn & Company. 1900. Pp. ix + 160.

The author has attempted in this treatise to place qualitative analysis upon a scientific basis, to do for this subject what Ostwald has done for analytical chemistry in general. It is very evident from the nature and arrangement of that part of the book devoted to the theory of solutions that it is a reflection of Ostwald's 'Foundations of Analytical Chemistry.' As such it is to be commended. The book, how-

ever, is evidently intended for a younger class of students than Ostwald intended his work. The author has so condensed the subject, and has attempted to cover so much ground, that it is believed it will be difficult for the student to grasp the real significance of the subject. It would have been a much more valuable book if the theory of solutions had been presented more simply, perhaps at some greater length, and with more numerous discussion of examples.

Some of the statements will, undoubtedly, give the student a false impression. On pages 19 and 21 it is stated that the amount of dissociation is increased by heat, giving the impression that this is a general law. Again, on page 21 one gets the idea that the greater the dilution the greater is the chemical activity. The explanation of the effect of a salt of a weak acid on the strength of a strong acid is merely a statement of fact.

That portion of the book, pages 27-157, devoted to the processes of qualitative analysis is well arranged, practical and progressive, including all the more recent and approved methods of separation. Considerable stress is laid upon spectroscopic analysis. The application of normal solutions to laboratory reagents is to be commended.

H. F.

Laboratory Instructions in General Chemistry. By

ERNEST A. CONGDON, Professor of Chemistry, Drexel Institute. Philadelphia, P. Blakiston's Son & Co. 1901. Pp. viii + 110.

It is difficult to review justly a laboratory book of experimental chemistry which is primarily intended for the author's own students, because there is no means of knowing what instruction the student has received from the lectures which accompany the laboratory course. When, however, it is stated that the book can be used with any standard text-book, the reviewer's task becomes much simpler, since the laboratory guide is supposed to follow somewhat closely the text of the standard work.

The first 21 pages of this book are devoted to experiments illustrating principally the laws of physical and chemical changes, and chemical reactions. These experiments, if the student is expected to follow them in order, are poorly selected and badly arranged. Indeed many of

them are entirely out of place. Some of the experiments involve the use of substances, the properties of which must be entirely unknown, and it would be impossible to explain at so early a stage the nature of the reactions taking place. The student is asked, on his second or third day in the laboratory, to try the following experiments: the action of sulphuric acid on a mixture of potassium chlorate and sugar, the preparation of gunpowder, and red and green fires. These experiments undoubtedly do represent physical and chemical changes, but perhaps too violently for a beginner. Under the chapter on reactions, the student is asked to write the reactions between ferric chloride and ammonia, and ammonium sulphocyanide, ferric hydroxide and hydrochloric acid. All this before oxygen has been studied!

Beginning with oxygen, however, the experiments are the standard experiments to illustrate the properties of the various elements.

An appendix of fifteen pages contains quantitative experiments to illustrate the laws of definite and multiple proportions and the various gas laws. It is believed that some of them are too difficult for first-year students in chemistry.

H. F.

The Chemists' Pocket Manual. A Practical hand-book containing tables, formulas, calculations, physical and analytical methods for the use of chemists, assayers, metallurgists, manufacturers and students. By R. K. MEADE, B. S., Instructor in Chemistry in Lafayette College, Easton, Penn. Easton, Penn., The Chemical Publishing Co. Price, \$2.00.

The nature and general contents of this book are described in the title. The book is well printed and contains such information as a chemist is almost daily in need of, and can be highly recommended as a reference book. The only feature of the book about which anything else than praise can be expressed is the price at which it is sold. The book is about 4 x 6 inches and contains 193 pages. The 'Chemiker Kalender,' the general nature of which this book follows, with its supplement, contains about three times the amount of material found in this book and only costs one half as much.

J. E. G.